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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Kinya Ozawa

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OLIFF & BERRIDGE, PLC  
P.O. BOX 19928  
ALEXANDRIA, VA 22320

EXAMINER

DUONG, THOI V

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 09/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/835,491

Applicant(s)

OZAWA ET AL.

Examiner

Thoi V Duong

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2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 August 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 4-10 ~~is/are~~ are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-10 ~~is/are~~ are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 22, 2004 has been entered.

Accordingly, claim 1 was amended, claim 3 was cancelled, and new claims 9 and 10 were added.

2. This office action is also in response to the Preliminary Amendment filed August 06, 2004 where claim 1 was amended and claim 3 was cancelled.

Currently, claims 1, 2 and 4-10 are pending in this application.

### ***Response to Arguments***

3. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 10 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which

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was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The recitation "each alignment film orienting all molecules of the liquid crystal adjacent to the corresponding alignment film in the same direction" is not disclosed in the specification.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bos et al. (USPN 6,141,074) in view of Numano et al. (USPN 6,313,898 B1) and Park (USPN 6,160,535).

Re claim 1, as shown in Fig. 1, Bos discloses a pixel area 10 of an active matrix liquid crystal display (LCD) device (col. 1, lines 15-18), comprising:

first and second substrates, the first substrate 14 having a surface proximate the second substrate, the second substrate 16 being a surface proximate the first substrate; an alignment film (not shown) disposed at each of the surfaces of the first and second substrates (col. 4, lines 1-65);

liquid crystal 12 disposed between the first and second substrates;

wherein a pretilt angle due to the alignment film is 0.5° to 30° for liquid crystal having positive dielectric anisotropy (col. 6, lines 33-37);

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wherein, re claim 2, the alignment film includes one of silicon oxide and silicon nitride (col. 8, lines 14-26).

Although Bos does not disclose the structure of the LCD device in details, it would have been obvious to one having ordinary skill in the art that the active matrix LCD device of Bos comprises a plurality of scanning lines; a plurality of data lines; pixel areas defined by the scanning lines and the data lines; a switching element provided in each pixel area; and a pixel electrode provided in each pixel area.

Bos discloses a LCD device that is basically the same as that recited in claim 1 except for a relationship between a thickness of the liquid crystal and a space between the pixel electrodes, and a driving method for the adjacent pixels.

As shown in Fig. 23 Prior Art, Numano et al. discloses that if a thickness of the liquid crystal disposed the first and second substrates is represented as  $d$ , and a space defined between the pixel electrodes is represented as  $L$ , a ratio  $d/L$  is at least 1 (col. 2, lines 8-17). Numano et al also discloses that the alignment film exists on both first and second substrates (col. 2, lines 4-5). Accordingly, the same alignment film is formed in space between body portions of pixel electrodes 12.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the LCD device of Bos with the teaching of Hattori by forming the two substrates and the pixel electrodes such that a ratio of a gap between the substrates and a spacing between the pixel electrodes is at least 1 for preventing the disclination caused by the lateral direction electric field (col. 1, lines 36-52).

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Further, Park discloses a conventional driving technique involving applying voltages having different polarities to pixels that are adjacent to each other by driving alternating pixel elements with negative and positive voltages as shown in Figs. 1B-1C to prevent the display from reducing sensitivity and brightness (col. 1, lines 51-64).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the liquid crystal device of Bos et al. with the teaching of Park by applying voltages having different polarities to adjacent pixels so as to improve display characteristics (col. 2, lines 10-12).

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bos et al. (USPN 6,141,074) in view of Numano et al. (USPN 6,313,898 B1) and Park (USPN 6,160,535) as applied to claims 1 and 2 above and further in view of Miyatake et al. (USPN 5,092,664).

The LCD device of Bos et al. as modified in view of Numano et al. and Park above includes all that is recited in claim 6 except for a projection type display apparatus employing such LCD device.

As shown in Fig. 1, Miyatake discloses a projection type display apparatus, comprising:

- a light source 15;

- a light modulating device that modulates light emitted from the light source, the light modulating device including a liquid crystal device 17; and

- a projection lens 18 that projects the light modulated by the light modulating device.

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Fig. 2 shows a sectional view of the liquid crystal device 17 wherein alignment films 31, 32 are rubbed in order to align the molecules axes of the liquid crystal molecules at a pretilt angle.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the LCD device of Bos in the projection type display apparatus of Miyatake so as to obtain a display with high picture quality by solving the problem of the brightness gradient (col. 2, lines 33-36).

9. Claims 4, 5, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bos et al. (USPN 6,141,074) in view of Numano et al. (USPN 6,313,898 B1) and Park (USPN 6,160,535) as applied to claims 1 and 2 above and further in view of Ichikawa et al. (USPN 6,339,459 B1).

The LCD device of Bos et al. as modified in view of Numano et al. and Park above includes all that is recited in claim 4, 5, 7 and 8 except for a color projection type display apparatus employing such LCD device.

Re claims 5 and 7, as shown in Figs. 1A-1C, Ichikawa discloses a projection type display apparatus comprising:

- a light source 1308;

- a light modulating device that modulates light emitted from the light source, the light modulating device including the liquid crystal device 1302 that modulates light into color beams of red, green and blue display portions (col. 6, lines 3-49); and

- a projection lens 1301 that projects the light modulated by the light modulating device.

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Re claim 4, Fig. 4 shows a LCD device comprising pixel electrodes 1326 of R, G, and B colors formed of Al (light-reflecting metal electrode) and a liquid crystal layer 1325 maintained in predetermined alignment by alignment layers (col. 8, lines 25-30).

Re claim 8, Ichikawa also discloses in prior art that the LCD device will be used not only for the personal computers, but also for workstations and televisions for home use (col. 1, lines 11-23).

Accordingly, by having the LCD device of Bos et al. with color pixels, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ this device in the projection type display apparatus of Ichikawa et al. so as to obtain a full-color projection image color-mixed in each pixel without the mosaic pattern (col. 3, lines 13-17).

10. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bos et al. (USPN 6,141,074) in view of Numano et al. (USPN 6,313,898 B1) and Park (USPN 6,160,535) as applied to claims 1 and 2 above and further in view of Sawada et al. (USPN 6,040,890).

The liquid crystal device of Bos et al. as modified in view of Numano et al. and Park above includes all that is recited in claim 9 except for a liquid crystal having a refractive anisotropy "Delta n" in a range of 0.13 to 0.108 and the thickness d being in a range of between 3.2 to 4.4 microns.

As shown in Fig. 1, Sawada et al. discloses a liquid crystal device comprising a liquid crystal layer having the product of a refractive anisotropy and a thickness of the layer ranging within  $0.3 \leq \Delta n \times d \leq 1.2$ , where  $0.05 \leq \Delta n \leq 0.25$  (col. 5, lines



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58-62 and col. 6, lines 48-50). Sawana et al. teaches that the value of  $d$  in  $\Delta n \times d$  can be selected as small for resulting in a preferable response time (col. 47, lines 46-51). Accordingly, if  $\Delta n = 0.119$ , the thickness  $d$  can be selected as 4 microns, the product of  $\Delta n$  and the thickness  $d$  will be  $0.119 \times 4 = 0.476$ , which satisfies the above requirements.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the liquid crystal device of Bos et al. with the teaching of Sawada et al. by employing a liquid crystal having a refractive anisotropy " $\Delta n$ " in a range of 0.13 to 0.108 and the thickness  $d$  being in a range of between 3.2 to 4.4 microns so as to obtain a good high-speed response, a wide visual range and a high contrast for the display (col. 2, lines 48-52).

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sawada et al. (USPN 6,040,890).

As shown in Fig. 1, Sawana et al. discloses a liquid crystal device, comprising:  
a first (upper) substrate 1 having a surface;  
a second (lower) substrate 1 having a surface that faces the surface of the first substrate;  
liquid crystal 3 disposed between the first and second substrates; and  
alignment films 2 disposed between the liquid crystal and the surfaces of the first and second substrates; and  
a pretilt angle from 0 to 20 degrees (col. 48, lines 36-39).

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Sawana et al. teaches that the liquid crystal has the product of a refractive anisotropy and a thickness of the layer ranges within  $0.3 \leq \Delta n \times d \leq 1.2$ , where  $0.05 \leq \Delta n \leq 0.25$  (col. 5, lines 58-62 and col. 6, lines 48-50); and that the value of  $d$  in  $\Delta n \times d$  can be selected as small for resulting in a preferable response time (col. 47, lines 46-51). Accordingly, if  $\Delta n = 0.119$ , the thickness  $d$  can be selected as 4 microns, the product of  $\Delta n$  and the thickness  $d$  will be  $0.119 \times 4 = 0.476$ , which satisfies the above requirements.

Although Sawana et al. does not disclose the structure of the LCD device in details, it would have been obvious to one having ordinary skill in the art that the active matrix LCD device of Sawana et al. comprises a plurality of scanning lines; a plurality of data lines; pixel areas defined by the scanning lines and the data lines; a switching element provided in each pixel area; and a pixel electrode provided in each pixel area (see also Abstract).

### **Conclusion**

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (571) 272-2293.

Thoi Duong  
08/30/2004



TARIFUR R. CHOWDHURY  
PRIMARY EXAMINER